

ANCYROCEPHALINAE (MONOGENOIDEA, DACTYLOGYRIDAE) FROM THE SEA FISHES OF THE FAMILY POMADASYIDAE

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ABSTRACT

The paper contains a description of two new genera and five species of *Monogenea* of the subfamily *Ancyrocephalinae* which differ from all other representatives of this subfamily in having a peculiar structure of the cuticle and the haptor.

Who have described one of these genera in honour of M. C. M. Bravo-Hollis who has made a great contribution to the studies of the monogenean fauna, and the second genus is dedicated to our friend and colleague in the exploration of this group, Prof. Dr. E. Caballero y Caballero.

RESUMEN

Este trabajo contiene una descripción de dos géneros nuevos y cinco especies de *Monogenea* de la subfamilia *Ancyrocephalinae* que difieren de todos los otros representantes de esta subfamilia porque tienen una estructura peculiar de la cutícula y del haptor.

Describimos uno de estos géneros en honor de la M. en C. Margarita Bravo-Hollis, quien ha hecho una gran contribución a los estudios de la fauna Monogenea y el segundo género es dedicado a nuestro amigo y colega en la exploración de este grupo, el profesor doctor E. Caballero y Caballero.

The following three species are similar to the representatives of the genus *Haliotrema* in their structure, but they differ from the latter in some peculiarities of the structure of the chitinous elements of the haptor, the situation of the vaginal opening on the ventral part of the body and in a peculiar structure of the integument.

On the grounds of these differences we consider it necessary to separate these species in a special genus.

Genus *Bravohollisia* Bych. et Nag.

Diagnosis: Dactylogyridae, Ancyroce-

phalinae. The haptor is not separated from the body, is armed by two pairs of anchors, two bars and 14 marginal hooks. The anchors are of the similar dimensions and shape with the developed roots directed at the right angle to each other. The bars are not articulated with each other. The marginal hooks are of a similar shape and dimensions. The eyespots are present. The gut crura unite at their ends. The ovary and the testicle are situated one behind the other. The vagina opens on the ventral part of the body, the spermaduct loops around the left gut crus. The copulatory organ has no acces-

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sory piece. The cuticle forms rhombic plates.

The type species *B. magna* Bych. et Nag.

They parasitize sea fishes of the family Pomadasyidae.

Bravohollisia magna gen. nov. sp. nov.
(Fig. 1, 2, 4, 5 y 6)

The body is elongate-oval with the maximum width in its middle part; the total length is 0.51 - 1.00 mm, the greatest width 0.13 - 0.24 mm. The haptor is not separated from the body and is armed with two pairs of anchors, two bars and 14 marginal hooks. The anchors are of a similar shape and dimensions; they have a broad shaft, well developed roots directed at right angles to each other, and a rather powerful curved part with a longitudinal slit-shaped groove along the point; the anchors are 0.027 - 0.030 mm long. The bars are slightly curved; the ventral bar is 0.063 - 0.073 mm, the dorsal one 0.068 - 0.078 mm long. The marginal hooks are tiny, similar in shape and dimensions, having a thin handle; they are 0.011 - 0.013 mm long.

The anterior body end has two groups of cephalic glands, each of them opening outside by three or four ducts. The four eyespots are developed; sometimes the anterior pair is dispersed into separate pigment granules. The pharynx is rounded; its dimensions are 0.05 - 0.06 x 0.04 - 0.06 mm. The gut crura unite with their ends behind the testicle, forming a simple rounded arch. The ovary is a little elongated; it is 0.07 - 0.08 x 0.05 mm and is situated in the middle part of the body.

The vagina opens in the ventral part of the body, to the right of its midline, almost on the same level with the genital atrium. The vaginal duct begins with a bag-like cavity with cuticularized walls, and then turns into a thin tube, opening

into a rounded seminal receptacle, which is situated anterior to the ovary. Vitellaria consist of many tiny follicular glands and stretch along the sides of the body from the pharynx to the end of the intestine. The testicle is rounded, with the diameter of 0.05 - 0.06 mm; it is situated behind the ovary; the spermaduct loops around the left gut crus. The copulatory organ has no accessory piece; it consists of a curved chitinous tube with a wide rounded bar at the base and a lash-like process at the end. The length of the tube together with the lash-like process is about 0.13, the basal diameter 0.04 - 0.05 mm.

The posterior part of the body from the end of the vitellaria to the haptor is filled with the strongly developed caudal glands; 4 rounded glands are situated near the anchors. The cuticle forms rhombic plates which are distinctly seen in the preparations and cover the whole body like an armour.

The largest plates are on the dorsal surface in its middle part, gradually decreasing in dimensions to the anterior and posterior ends of the body. Similar plates of smaller dimensions cover all the ventral part of the body, except the haptor.

The host, localization, locality: on the gills of *Pomadasys argenteus* and *P. hasta* from the South China Sea (Island of Hainan).

12 specimens were studied (6 from *P. argenteus* and 6 from *P. hasta*) alive, in glycerine-gelatine total preparations, and in a series of cross sections. The type specimen (N^o Mon. - 3016) and the paratypes (N^o 3017 - 3019) are in the Parasitology Laboratory, Zoological Institute of the Academy of Sciences of the USSR.

Bravohollisia tecta sp. nov.
(Fig. 3, 7 - 9)

These worms are similar to *B. magna* in the form and shape of the body and

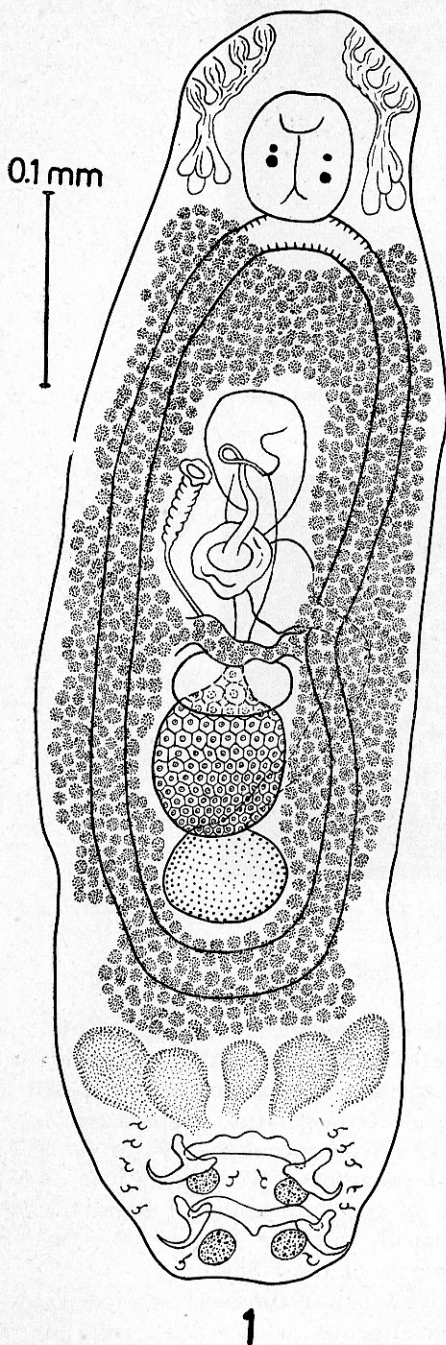


Fig. 1. *Bravohollisia magna* sp. nov. Complete worms, ventral view.

the chitinoid elements of the haptor. The total body length is 0.44 - 0.69 mm, the greatest width 0.08 - 0.15 mm. The anchors are 0.016 - 0.018 mm, the marginal hooks 0.010 - 0.011 mm and the bars 0.023 - 0.030 mm long. There was no possibility of investigating the inner structure of the worms because of the strongly developed rhombic armour of the surface, which covers the whole body of the worms. The copulatory organ, as well as that of the foregoing species, has no accessory piece and consists of a curved tube with a lash-like process at the end and a rounded plate-like base. The tube is about 0.04 mm long, the base diameter is 0.012 mm.

This species differs from *B. magna* in smaller dimensions of body and in the shape of the chitinoid elements of the haptor and the copulatory organ.

Host, localization, locality: on the gills of *Pomadasys argenteus* from the South China Sea (Island of Hainan). 6 specimens of worms were studied in glycerine-gelatine preparations.

The type specimen (Nº Mon. 3031) and the paratypes (Nº Mon. 3032 - 3033) are in the Parasitology Laboratory, Zoological Institute of the Academy of Sciences of the USSR.

Bravohollisia pomadasis sp. nov.
(Fig. 10-13)

The worms are similar to the foregoing species in the shape of the body and the chitinous elements. The total length is 0.57 - 0.81, the greatest width 0.05 - 0.10 mm. The anchor of the ventral pair is 0.017 - 0.018 mm, that of the dorsal pair 0.014 - 0.016 mm; the marginal hooks are 0.010 - 0.012 mm, the connective bars 0.029 - 0.033 mm long. The dimensions of the pharynx are 0.024 - 0.050 x 0.038 - 0.040 mm. The anatomy is similar to that of *B. magna*. The vaginal opening is armed with a chitinoid

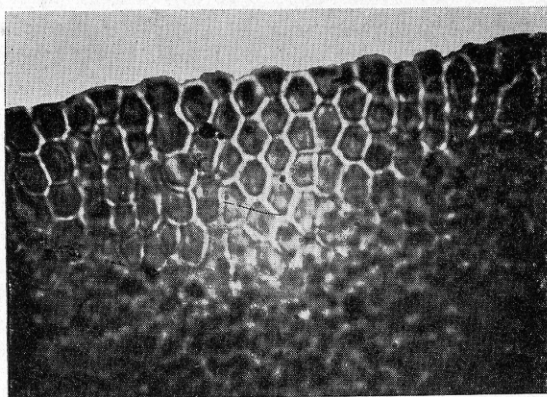


Fig. 2. *Bravohollisia magna* sp. nov. The rhombic plates of the cuticle. x 1350

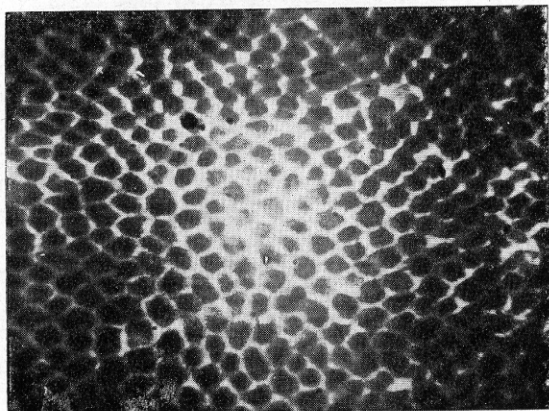


Fig. 3. *Bravohollisia tecta* sp. nov. The rhombic plates of the cuticle. x 1350

rosette. The copulatory organ consists of a thin tube with a short hook-like process at the end and a rounded base plate. The tube is about 0.04 mm long, the base diameter is 0.01 mm.

The rhombic plates of the cuticle can be seen only on some parts of the body as they seem to detach easily in fixation.

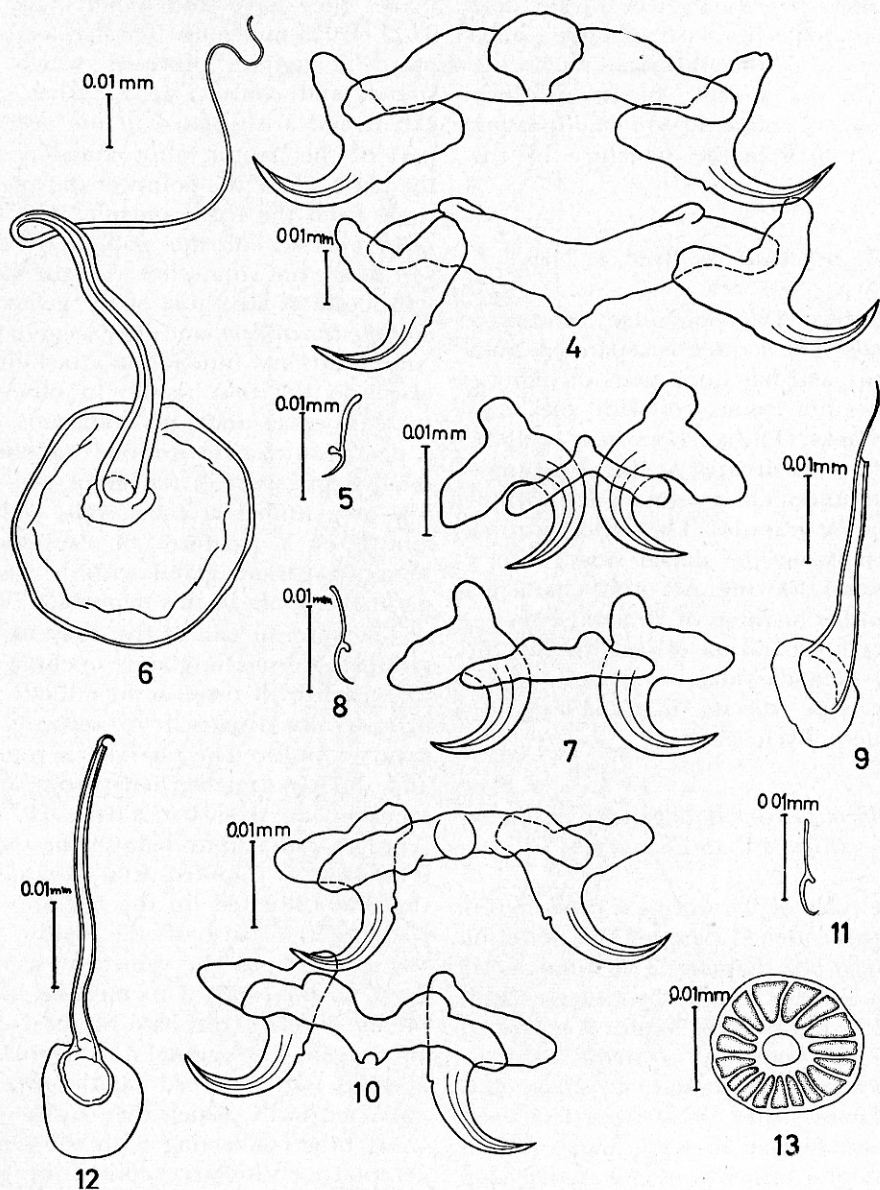
This species differs from *B. magna* and *B. tecta* in the dimensions and shape of chitinous elements of the haptor, the shape of armament of the copulatory organ and the vagina.

Host, localization, locality: on the

gills of *Pomadasyss maculatus* from the South China Sea (Island of Hainan). 18 specimens of worms were studied in the glycerine-gelatin preparations.

The type specimen (N^o Mon. 3034) and paratypes (N^o Mon. 3035-3038) are in the Parasitology Laboratory, Zoological Institute of the Academy of Sciences of the USSR.

We separate the next two species in a special genus, as they differ from all the representatives of the subfamily Ancyrocephalinae in having special digitate processes of the haptor, which in con-



Figs. 4-6. *Bravohollisia magna* sp. nov. 4 - anchors and bars, 5 - marginal hook, 6 - copulatory organ.

Figs. 7-9. *Bravohollisia tecta* sp. nov. 7 - anchors and bars, 8 - marginal hook, 9 - copulatory organ.

Figs. 10-13. *Bravohollisia pomadasis* sp. nov. 10 - anchors and bars, 11 - marginal hook, 12 - copulatory organ, 13 - armament of the vagina.

contrast to the representatives of the genus *Hamatopeduncularia* do not bear marginal hooks but have adhesive glands and seem to be the additional anchoring organs of the worms. In its anatomy this genus is similar to *Bravohollisia* but differs from it in the structure of the cuticle.

Genus *Caballeria* Bych. et Nag.

Diagnosis: Dactylogyridae, Ancyrocephalinae. The haptor is separated from the body and has three pairs of digitate processes not connected with the marginal hooks. The anchors have well-developed roots situated at the acute angle to each other. The eyespots are dispersed in separate granules. The cuticle is thick (especially on the dorsal side) with a transversal drawing. All other characters are similar to those of *Bravohollisia*.

They are parasites of sea fishes of the family Pomadasyidae.

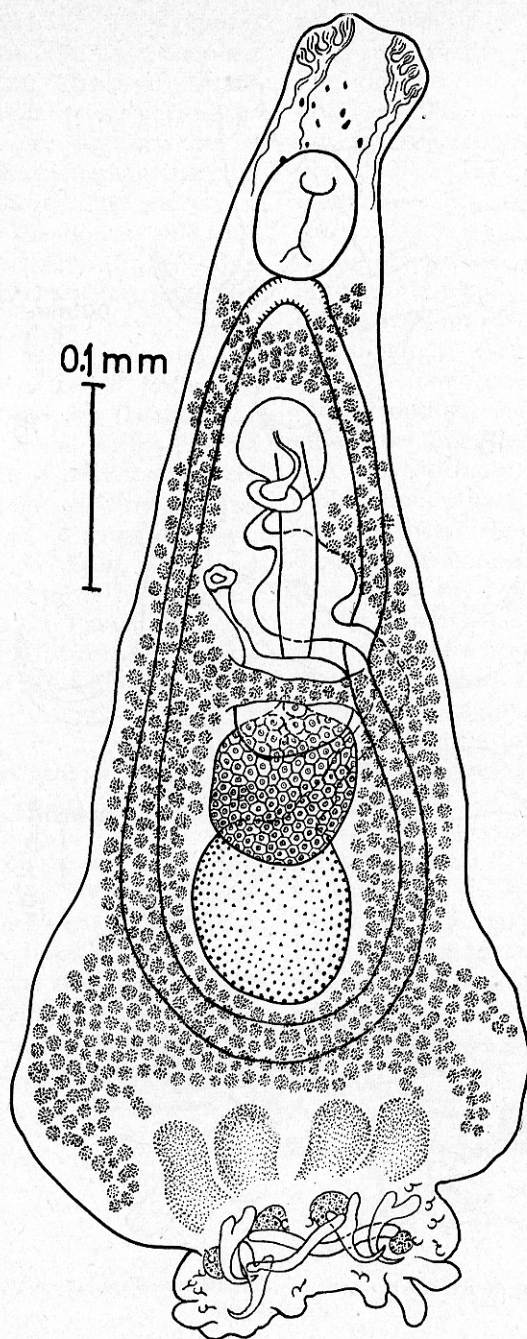
The type species is *Caballeria pedunculata* Bych. et Nag.

Caballeria pedunculata gen. nov. sp. nov.
(Figs. 14, 15-17 and 21)

The body of the worms is cone-shaped with the widened part on the posterior end, near the haptor. The total body length is 0.69-0.76 mm the greatest width is 0.14 - 0.16 mm. The haptor is separated from the body by a small isthmus. The anchors are similar in shape and dimensions: they have well-developed roots situated at an acute angle to each other and a rather powerful curved part with a longitudinal slit-shaped groove along the point. The greatest length of the hooks of the ventral, as well as of the dorsal pair, is 0.037 - 0.041 mm. The bars are straight or slightly curved and do not articulate with each other; the ventral bar is 0.056 - 0.064 mm the dorsal one 0.063 - 0.074 mm long. The marginal

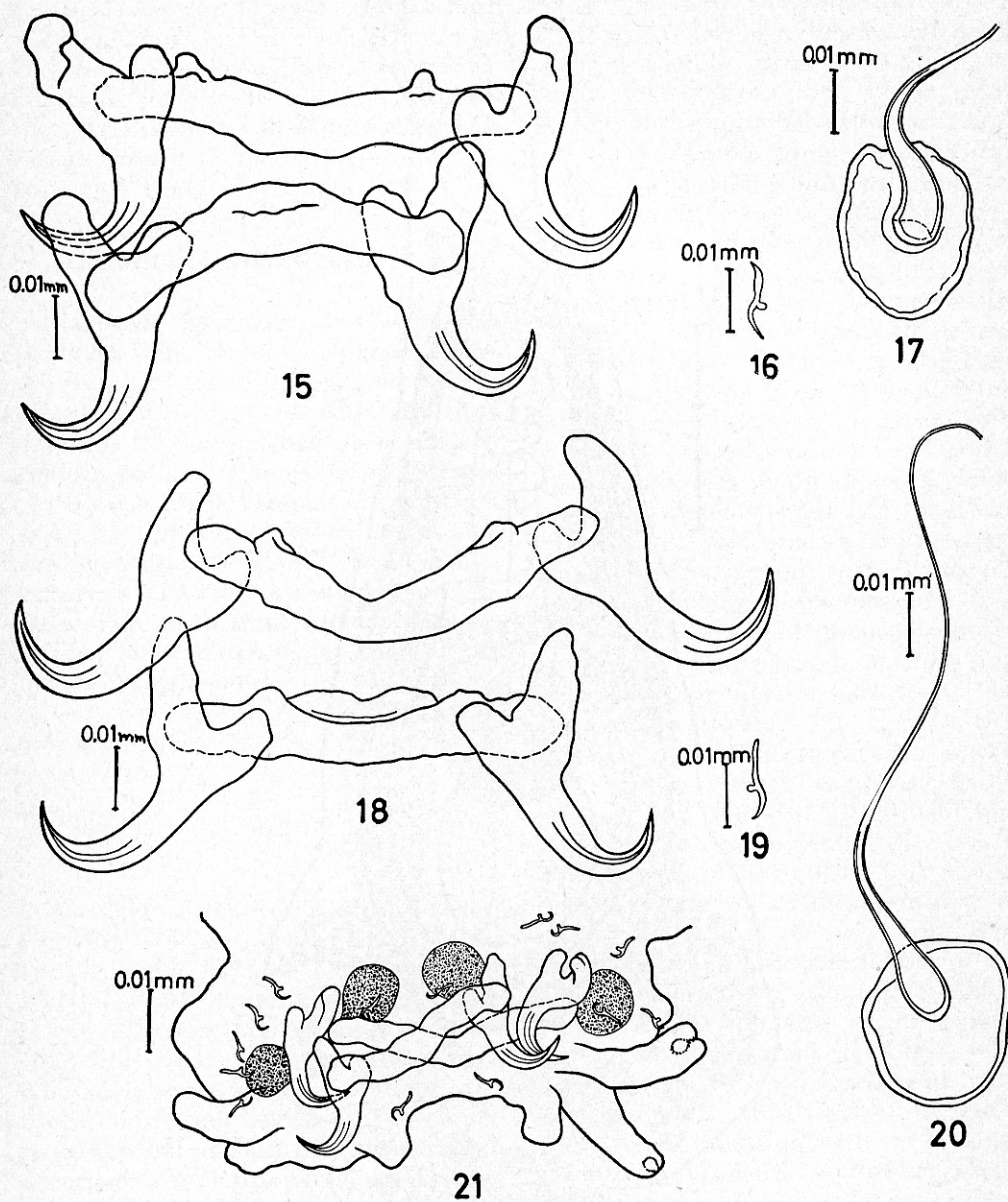
hooks are of similar dimensions and shape; they have thin handles and are 0.011 - 0.013 mm long. The haptor has 3 pairs of digitate processes which can stretch and contract to a rather great extent and are situated in the posterior part of the haptor, approximately near the place where the points of the anchors come from the tissue outside. The digitate processes of the haptor of these worms are not connected with the marginal hooks, as are those of the genus *Hamatopeduncularia*, and they seem to have some additional function in attaching the worm to the host tissue. In observing these processes under an immersion with a phase-contrast device one can notice small depressions in the shape of a hollow or a funnel at their ends, and the mouth of a pyriform or drop-shaped semi-transparent gland with a sharply defined capsule in this depression.

The anterior end of the body has two groups of cephalic glands opening outside, each with three or four ducts. The eyespots are dispersed in separate pigment granules. The pharynx is rounded and slightly stretched lengthwise; its dimensions are 0.06 - 0.07 x 0.05 - 0.07 mm. The gut crura unite behind the testicle. The ovary is rounded, 0.06 - 0.08 mm in diameter, situated in the beginning of the posterior part of the worm. The vagina opens on the ventral part of the body, to the right of its midline, almost on the level of the base of the copulatory organ. The vaginal duct begins with a small funnel-shaped cavity with cuticularized walls, which then turns into a short tube connecting with the seminal receptacle. Vitellaria consist of many tiny follicles and spread from the pharynx to the end of the intestine. The testicle is rounded, 0.09 - 0.10 mm in diameter; it is situated behind the ovary, and the spermaduct loops around the left gut crus. The copulatory organ has no accessory piece; it consists of a chitinous tube with a widened initial part



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Fig. 14. *Caballeria pedunculata* sp. nov. Complete worm, ventral view.



Figs. 15-17. *Caballeria pedunculata* sp. nov. 15 - anchors and bars, 16 - marginal hook, 17 - copulatory organ.

Figs. 18-20. *Caballeria robusta* sp. nov. 18 - anchors and bars, 19 - marginal hook, 20 - copulatory organ.

Fig. 21. *Caballeria pedunculata* sp. nov. Haptor with the digitate processes.

and a plate-shaped base. The tube is about 0.05 mm long; the base diameter is 0.022-0.030 mm. There are many caudal glands in the posterior part of the body, in front of the haptor; and 4 rounded glands are situated in the haptor, near the anchors. The cuticle is thick, specially on the dorsal side. On both surfaces of the body it forms a thin transversal drawing, characteristic of this species.

Host localization, locality: on the gills of *Pomadasys hasta* and *P. argenteus* from the South China Sea (Island Hainan). 10 specimens of the worms (9 from *P. hasta* and 1 from *P. argenteus*) were studied in the glycerine-gelatine preparations and some series of cross sections. The type specimen (N^o Mon. 3020) and the paratypes (N^o Mon. 3021-3028) are in the collection of the Parasitology Laboratory, Zoological Institute of the Academy of Sciences of the USSR.

Caballeria robusta sp. nov.
(Fig. 18-20)

The body shape of the worms is similar to that of *C. pedunculata*. The total length is 0.69-1.00 mm the greatest width 0.13-0.17 mm. The haptor is separated from the body and has the same digitate processes as in the foregoing species. The chitinoid elements of the haptor are similar to those of *C. pedunculata*. The

greatest length of the anchors is 0.038-0.047 mm; that of the bars is 0.060-0.072 mm, the marginal hooks are 0.012-0.013 mm long. The anatomy of the worms is not investigated; the eyespots are dispersed. The pharynx is slightly stretched lengthwise; its dimensions are 0.060-0.074 x 0.048-0.064 mm. The vagina opens on the ventral part, to the right of the middle body line; the vaginal duct begins with an elongate-oval cavity with cuticularized walls, from the end of which a long tube comes off, opening into a rounded seminal receptacle. The copulatory organ consists of a very long and thin chitinoid tube with a rounded basal plate. The tube is 0.10-0.12 mm long; its basal diameter is 0.025 mm. The cuticle is of the same structure as that of the previous species.

The species is similar to *C. pedunculata* and differs from it only in the shape of the copulatory organ and the armament of the vagina.

Host, localization, locality: on the gills of *Pomadasys argenteus* and *P. hasta* from the South China Sea (Island of Hainan). 9 specimens of worms were studied (7 from *P. argenteus* and 2 from *P. hasta*) in the glycerine-gelatine preparations. The type specimen (N^o Mon. 3024) and the paratypes (N^o Mon. 3025-3027) are in the collections of the Parasitology Laboratory of the Zoological Institute, Academy of Sciences of the USSR.